The initial Regent valve implanted in these 3 cases was likely oversized and the pivot guard not seated properly. In each case, the Regent valve was replaced with a valve of a smaller effective tissue annulus diameter (ETAD) compared with the St Jude Medical standard model and a smaller effective orifice area (EOA) determined from industry-provided data.[4,5] In case 1, a 25-mm tissue annulus diameter (TAD) St Jude Medical Regent valve (TAD 25 mm, ETAD 28 mm, EOA 2.6 cm^2) was replaced with a 23 mm Regent valve (TAD 23 mm, ETAD 26 mm, EOA 2.5 cm^2). In case 2, a 27-mm Regent valve (TAD 27 mm, ETAD 30 mm, EOA 3.5 cm^2) was replaced with a 27-mm CarboMedics standard valve (Sulzer Carbomedics, Inc, Austin, Tex) (TAD 27 mm, ETAD 27 mm, EOA 2.2 cm^2). In the third case, a 25-mm Regent valve was replaced with a 25-mm CarboMedics standard valve (TAD 25 mm, ETAD 25 mm, EOA 1.5 cm^2); again a smaller valve by ETAD with a markedly smaller EOA. Suture technique may have compounded the oversizing. The high EOA in all Regent valves makes oversizing unnecessary.[6] The calculations of Pibarot and associates[7] for patient-prosthesis mismatch indicate only 1 patient (case 3), after a 25-mm CarboMedics valve implant was at risk for mismatch (EOA 1.5 cm^2, EOAI 0.6 cm^2/mm^2).

In summary, the problems Øvrum and Tangen encountered can be explained by implantation techniques, depth of sutures, and oversizing of the Regent valve rather than by the valve itself.

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Reply to the Editor:

We appreciate the interest in our brief report[1] regarding acute leaflet arrest in the St Jude Medical (SJM) Regent aortic valve (St Jude Medical, Inc, St Paul, Minn). The remarks forwarded by Dr Emery clearly indicate that specific precautions must be taken regarding the technique of implantation. His figure 1 demonstrates the shorter distance from the subvalvular tissue to the hinges. He proposes everting mattress sutures for inserting all the types of SJM valves, and this is certainly a safe technique. However, we are not convinced that this is the most common procedure for implantation of supra-annular prostheses. To our knowledge, the most preferred technique is ventricular-to-aortic sutures for supra-annular valves, to optimize the orifice area.

These circumstances were the main reason for our publication. We used standard and widely recognized suture techniques for aortic valve replacement, and severe technical problems occurred with the SJM Regent valve. The reported cases were routine operations without any particular difficulties from the patient's side. After the valve was tied down, the leaflets were unmovable and rotation was impossible, due to entrapment of the subvalvular tissue into the hinges. The operations were performed by senior cardiac surgeons, having implanted a large number of several types of aortic valve prostheses during more than 25 years. The situation was most unpleasant, particularly considering the potential risk of pledget escape when cutting the sutures for removal of the valve. All patients had an uneventful recovery after a prolonged operation for rereplacement. However, similar negative experience has not been published with other valves, and therefore we wanted to share our experience with other surgeon colleagues.

We do not believe that oversizing was the case in any of the patients. They were all adult male patients with normal size of the aortic ostia and candidates for 25-mm to 27-mm valves. If the SJM Regent valve has to be downsized on routine basis, the hemodymamic advantages must, at least partly, be abolished. [1]

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Mechanical aortic valve malfunction: An intraoperative BioGlue complication

To the Editor:

I read "Mechanical Aortic Valve Malfunction: An Intraoperative BioGlue Complication" by Karimi and associates. The communication reports that BioGlue (Cryolife Inc, Kennesaw, Ga) can migrate through the aortotomy suture line. It was interesting that there was an interval after the glue was applied to the suture line but before it migrated through to cause the mechanical valve incompetence (demonstrated by the altered function of the prosthetic valve on transesophageal echocardiography). Also of concern was the fact that the BioGlue migrated through 4-0 suture holes rather than a defect in the aortotomy closure.

I recently performed repair of a type I aortic dissection with ascending aorta and hemic-arch replacement and with resuspension of the aortic valve. The patient had been treated with heparin, clopidogrel, and aspirin after admission because of an assumed diagnosis of myocardial infarction. After the patient was separated from cardiopulmonary bypass, with protamine, fresh-frozen plasma, and platelets having been administered, there was still oozing from the suture line. A thin layer of BioGlue was applied, with cessation of the bleeding. The patient had a cardiac output of 7 L and excellent intraoperative myocardial function.

Forty-five minutes after return to the intensive care unit, the patient became hypotensive, with a 1-mm increase of the

lateral electrocardiogram lead. There was minimal output through the chest tubes, but because the patient was unresponsive to inotropes, the chest was opened. The patient was resuscitated with open massage. After several minutes of open massage and intracardiac epinephrine, the patient had normal blood pressure and no electrocardiogram changes. His cardiac output was more than 5 L without inotropic support. There was no bleeding from the suture lines.

After reading this communication, my suspicion is that the BioGlue application to the anterior part of the aortic root suture line migrated through the suture line and embolized the coronary arteries after the patient returned to the intensive care unit. Other possibilities include air or tissue embolus or localized redissection in the proximal root.

I would recommend the use of BioGlue on suture lines only to achieve hemostasis and would use only a minimal amount of the adhesive.

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Right axillary incision: Is it really superior to anterolateral thoracotomy?

To the Editor:

I read the article by Prêtre and associates[1] on right axillary incision performed for a wide range of congenital cardiac defects. The authors have described the cosmetic and functional advantage of this approach in various surgical procedures. Although I commend them for using this in a wide array of congenital heart diseases, I was surprised to find that the advantage it allegedly scores over anterolateral thoracotomy has been that there is no interference with breast development. While avoiding the necessity of groin cannulation for establishing CPB, there has not been a single incidence of intraoperative technical complications in a series of 140 patients in whom an anterolateral approach was used for atrial septal defect closure in my previous institution's experience (at G.K.N.M Hospital, Coimbatore, India).[2] There also has not been any problem with breast development. The institution of CPB was conventional in the main incision itself with no significant increase in operative time or subsequent bleeding or hospital stay. Posterolateral thoracotomy may be technically demanding too, and the necessity for groin exposure in small children makes it less attractive than anterolateral thoracotomy. Once the dissection plane is established well in the submammary tissue, an approach via the fourth intercostal space gives good exposure to both the aorta (once thymic tissues are removed) and the venae cavae for cannulation. Both the atria are easily approachable for most congenital defects. When a correct tissue approximation is achieved with no puckering of breast tissue, there is no anticosmesis involved in breast asymmetry nor any cage deformity if well aligned. To stress again, asymmetric breast development is more feared than proven in these patients who undergo anterolateral thoracotomy.

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Reply to the Editor:

The comment made by Dr Nagarajan finally comes down to an evaluation of the benefit of thoracic incisions on overall cosmesis and patient acceptance of the incision. His statement that anterolateral thoracotomy does not lead to significant breast deformation is correct only when the incision is applied in adults. In this age group, the breasts are developed and the inframammary fold is delineated. An anterolateral thoracotomy, however, in a prepubescent girl does lead to breast and chest asymmetry. Because full thoracic development requires more than a decade, and because troubles related to the private sphere are difficult to express, the cosmetic and psychological results of the anterolateral thoracotomy have been poorly evaluated and often ill-estimated. The fact that most patients—even the dissatisfied ones—never actively expressed complains regarding the incision (something that appears futile in view of the correction that was performed on the heart) was put to the credit of the approach. Bleiziffer and coworkers[1] convincingly demonstrated that significant impairment (more than 20% of volume difference) in the development of the right breast occurred in 61% of the female patients after an anterolateral thoracotomy, yet only a minority of them expressed their discontentment. The asymmetry was the consequence of damage not only to the breast gland but also to the pectoralis muscles (which need be disinserted from the rib) and sometimes to the rib and costochondral junction. This also explains the suboptimal results achieved in boys. Interestingly, in this study, women with anterolateral thoracotomy and asymmetrical breasts had a better psychological acceptance of their image than those with a classic sternotomy and symmetrical breasts, evidencing the burden played by the visibility of the incision. Even if the subxiphoid approach, which leaves the upper part or "décolleté" of the thorax free, will be better accepted than a full sternotomy, the visibility of the incision will remain a nuisance for some young people.[2] The posterolateral approach requires division of the latissimus dorsi and sometimes part of the serratus anterior muscle.[3] The cosmetic appearance of the scar is certainly comparable with our axillary incision. Stature problems and weakness of the shoulder are, however, possible consequences of this incision. In our opinion, the axillary incision, because it is located in a muscle-free area and because it spreads more than it divides muscles, leads to yet incomparable cosmetic and functional results in children. Schreiber and coworkers[4] recently reported similar results with the same incision (using a central cannulation) in an older population. To us, the anterolateral incision as advocated by Nagajaran is indicated in adults only, especially if the cardiac repair can be performed endoscopically.[5]